

(21) Application No 8110623  
(22) Date of filing 4 Apr 1981  
(43) Application published  
20 Oct 1982

(51) INT CL<sup>3</sup>  
A47C 27/04  
(52) Domestic classification  
A4M 1C5A 1D2 1D4 1D6

(56) Documents cited

GB 1439290  
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GB 1192669  
GB 1321865  
GB 0948275  
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(58) Field of search  
A4M

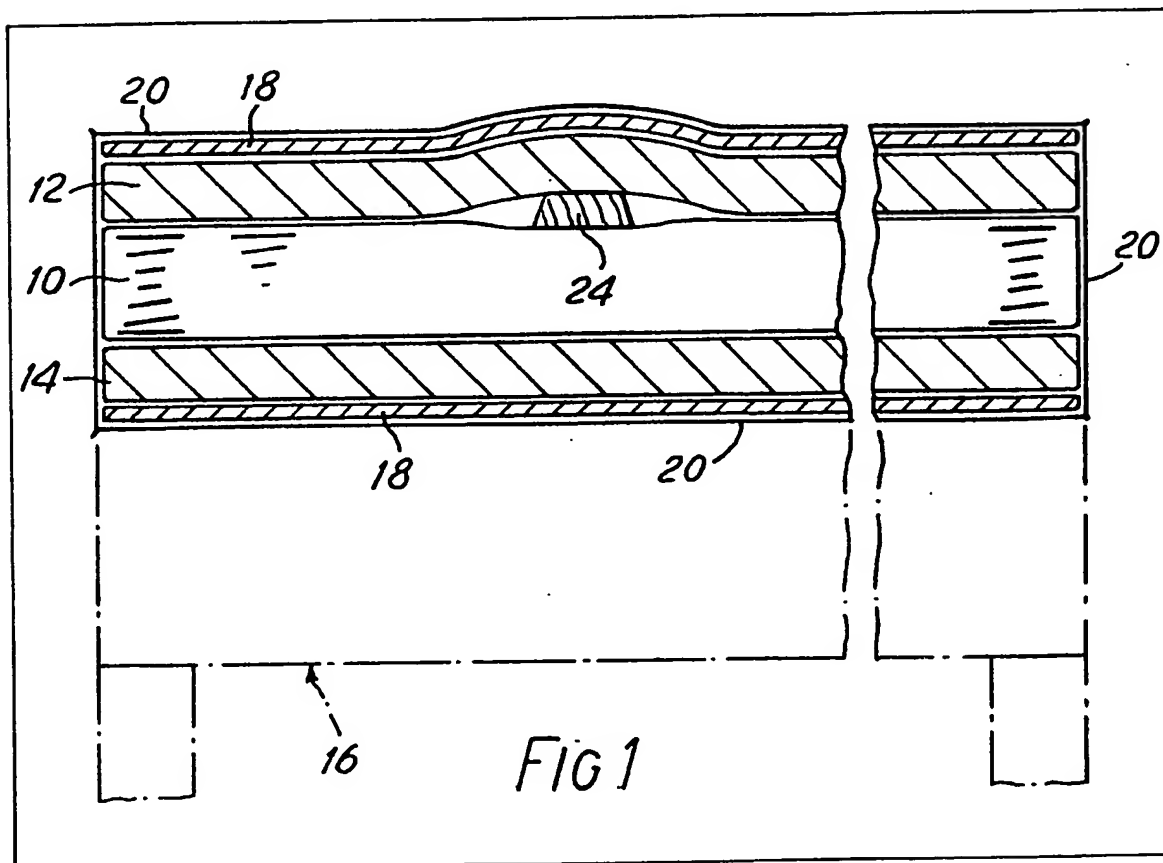
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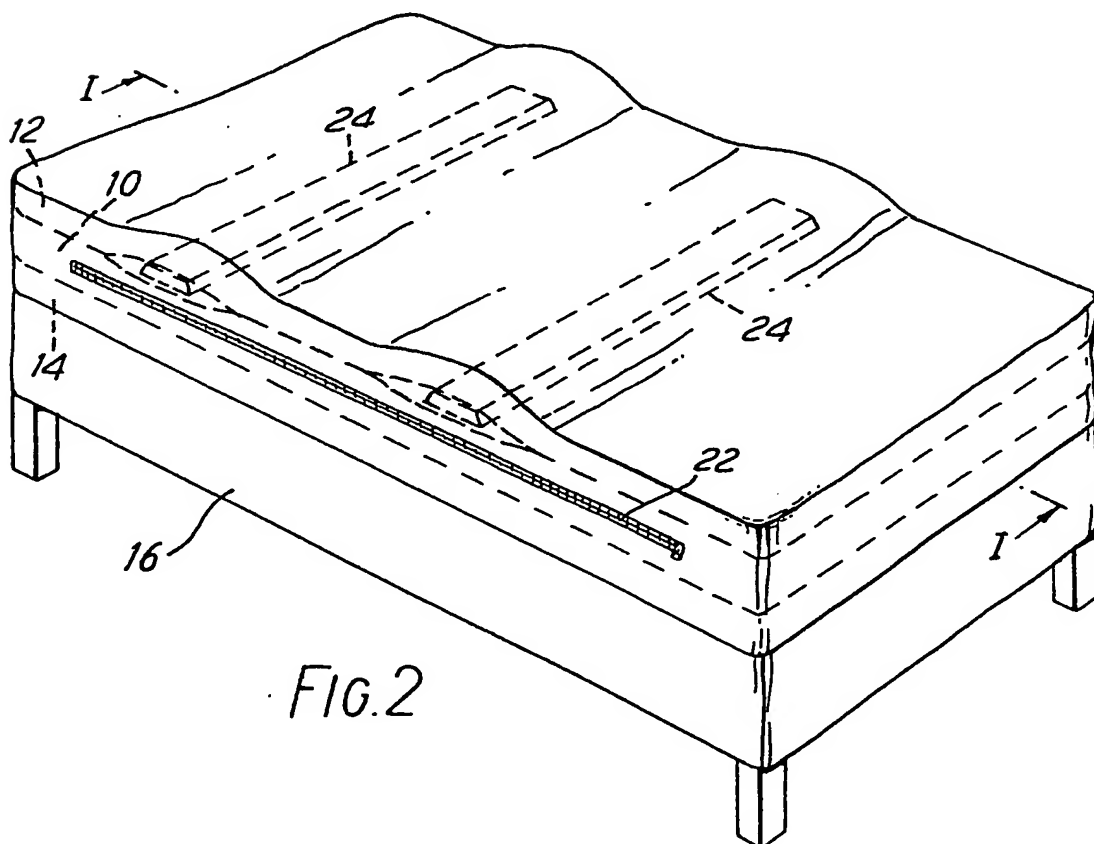
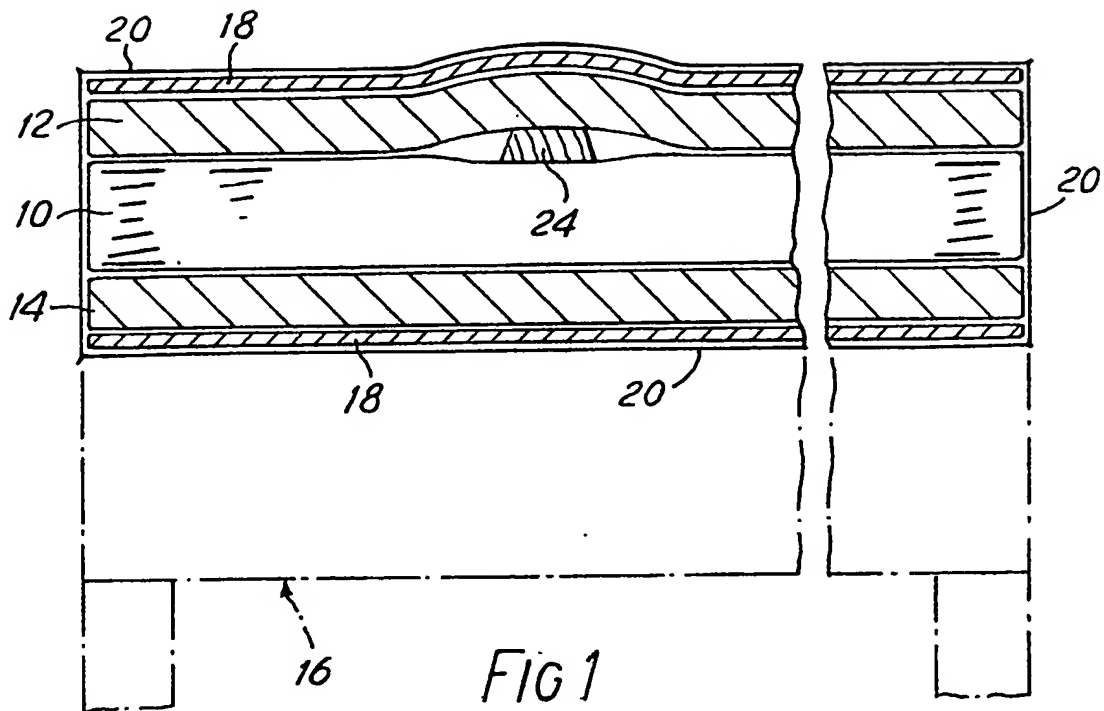
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(54) Adjustable mattresses

(57) A mattress has a sprung support layer 10 sandwiched between two resilient foam layers 12, 14. One or more elongate stiffening inserts 24 can be inserted transversely between the support layer 10 and either of the foam layers 12, 14, in order to locally modify the support characteristics. The sandwich construction permits the mattress to be turned over. The layers 12 and 14 may have different degrees of resilience, so that alternative firmnesses of the mattress are available.





## SPECIFICATION

## Mattresses

5 This invention relates to mattresses. In particular it relates to an improvement or modification of the mattresses described in UK patent application No. 8001840, of Associated Surgical Engineers (International) Limited, which are intended to provide relief to sufferers from back pain.

10 A copy of U.K. patent application No. 8001840 is filed herewith. It describes a mattress having two layers, a lower resilient supporting layer and an upper flexible resilient comfort layer, both of foam material. Between the two layers, it is possible to introduce a number of elongate inserts or modifiers. These enable the occupant of the bed to tailor the mattress to provide support in the regions where he or she most needs it. This is a considerable improvement over known orthopaedic mattresses and over the simpler expedient of placing a stiff board under a conventional mattress, because in these earlier arrangements the support given to the occupant's back cannot be changed to suit specific requirements.

However, the use of an all-foam construction (albeit in two layers) does not give the comfort and luxury of a conventional sprung mattress. Also it is desirable that sprung mattresses should be regularly turned over if all the springs are to retain their maximum resilience and the mattress is thus to remain comfortable. This would not be possible if a sprung mattress were used as the supporting layer in the mattresses of 8001840, because the occupant would then no longer have the benefit of the foam comfort layer, and because once the mattress has been turned over, the inserts or modifiers would have little effect on the occupant through the thickness of the sprung mattress. Furthermore it is not possible to change the degree of firmness of the mattresses in 8001840 (i.e. the firmness of the upper comfort layer), which can be an important factor in providing a mattress which any given occupant will find most comfortable. To suit any given customer would mean that several mattresses with different density foam in the comfort layer would have to be stocked.

The present invention provides a mattress having a support layer of a sprung construction, sandwiched between two comfort layers each of a resilient material (e.g. a foam material), the comfort layers and the support layers being held together in a manner which permits one or more inserts or modifiers to be inserted between either comfort layer and the support layer, at desired locations. This permits the mattress to be turned over so that either one comfort layer or the other is uppermost.

Preferably, the two comfort layers have different degrees of resilience (e.g. different densities of foam material are used). This enables a mattress with a different degree of firmness to be produced simply by turning it over.

The layers may be held together by enclosing them in a common outer casing, e.g. of textile material.

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65 One embodiment of the invention will be described by way of example, with reference to the accompanying drawings wherein:

Fig. 1 is a longitudinal cross-section through a mattress on a bed, and

70 Fig. 2 is a perspective view of the bed, in which the line I-I is the line of the section of Fig. 1.

Referring to the drawings, the mattress comprises a support layer 10 having a sprung construction as found in conventional sprung mattresses. In a double bed measuring 6'3" x 4'6" (190cm x 137 cm) there might be 288 springs of 12½ gauge. This is sandwiched by two comfort layers 12, 14 of flexible resilient polyurethane foam material. One layer 12 is of somewhat denser polyurethane foam than the other layer 14, the density of each being selected so that when the mattress is used with that layer uppermost, a desired degree of firmness of the upper comfort layer is achieved. Each layer 12, 14 may be of the order of 5 or 10 cm thick.

85 Over the side of each comfort layer 12, 14 away from the sprung layer 10 there is laid a coir matting layer 18 (not shown in Fig. 2), suitably 2 to 3 cm thick. This provides protection and ventilation to the surfaces of the mattress and improves its external appearance. A textile casing 20 is provided over all the component layers of the mattress. If desired, this may be permanently attached to the two coir matting layers 18, or these layers 18 may be replaced by layers which are quilted with the outer casing 20.

95 The layers 10, 12, 14 are not attached to each other, but rely on the casing 20 to hold them together. The side edge of the casing 20 is provided with a longitudinal zip fastener 22. By opening this, it is possible to introduce elongate stiffening inserts or modifiers 24 between either comfort layer and the support layer 10, in order to modify the support profile given to the occupant by the mattress. The inserts 24 are suitably trapezoidal in cross-section and may be made of wood, plastics, or even padded cardboard, suitably with a polyvinyl chloride covering.

The occupant can place the inserts 24 between the uppermost comfort layer and the support layer in whatever numbers and positions he finds gives him most relief. Some possible arrangements are discussed in patent application No. 8001840 referred to above, along with constructional details of the inserts. A suitable set of inserts will be supplied with each mattress.

115 With mattresses for double beds, it is advantageous to supply inserts whose length corresponds to half the width of the mattress. This allows inserts to be individually positioned in different positions for the two occupants of the bed, or for inserts to be provided for one occupant and not the other. This is again discussed in 8001840. Double mattresses will usually have a zip 22 down each side edge to facilitate this. For single beds, the length of the inserts will normally be only a little less than the width of the bed, as shown in Fig. 2, and a single zip 22 may suffice.

In use, since the two comfort layers are of different degrees of firmness, a mattress with the desired firmness is obtained simply by placing the mattress on normal divan base 16 with appropriate layer 12 or 14 uppermost. If it is desired to be able to turn the mattress over (to keep the springs in top condition) while retaining the same firmness, identical layers 12, 14 may be supplied. It will be appreciated that whichever way up the mattress is positioned, the inserts 24 can be placed directly under the uppermost comfort layer 12, 14, over the sprung layer 10, so that the occupant receives the full benefit of the modified support which they provide.

#### CLAIMS

1. A mattress having a support layer of a sprung construction, sandwiched between two layers each of a flexible material, the flexible layers and the support layer being held together in a manner which permits one or more inserts or modifiers to be inserted between either flexible layer and the support layer, at desired locations.
2. A mattress according to claim 1 wherein the two flexible layers are made of foam material.
3. A mattress according to claim 1 or claim 2 wherein the two flexible layers have different degrees of resilience.
4. A mattress according to claim 2 wherein the two flexible layers are made of respective foam materials having different densities.
5. A mattress according to any one of the preceding claims including a respective further layer over each said flexible layer, on the side thereof remote from the support layer.
6. A mattress according to any one of the preceding claims wherein the layers are enclosed by a common outer casing which holds them together.
7. A mattress according to claim 5 together with claim 6 wherein said further layers are attached to or quilted with the outer casing.
8. A mattress according to claim 6 or claim 7 having a zip fastener arranged longitudinally in one side of the casing to permit insertion and removal of the inserts or modifiers.
9. A mattress according to any one of the preceding claims in combination with one or more said inserts or modifiers, the inserts or modifiers being elongate and of a length to permit insertion transversely of the mattress, each insert or modifier acting when so inserted between the support layer and the uppermost flexible layer to modify the support characteristics of the mattress in the region thereof.
10. A mattress according to claim 9 wherein the insert or modifier is sufficiently thick that when inserted between the support layer and the upper flexible layer it lifts the upper surface of the flexible layer in the region thereof above other parts of said upper surface.
11. A mattress according to claim 9 or claim 10, being a double mattress, wherein the inserts or modifiers are of a length which corresponds to substantially half the width of the mattress.
12. A mattress substantially as described herein with reference to the accompanying drawings.

Printed for Her Majesty's Stationery Office by The Tweeddale Press Ltd.,  
Berwick-upon-Tweed, 1982.  
Published at the Patent Office, 25 Southampton Buildings, London, WC2A 1AY,  
from which copies may be obtained.